

## Project Description

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### ESSENTIAL QUESTIONS:

- What is urban ecology?
- How can humans create sustainable and efficient modern urban ecosystems?

### OVERVIEW:

Students will discover how humans interact with nature in urban ecosystems. They will understand the terms sustainable and efficient in order to apply them to designing improved modern cities. Students will research green building techniques, alternative transportation options and alternate energy. As a class, students will collaborate in both science and humanities classes to present their research in an Urban Ecology Magazine. The class goal is to publish our magazine in time for the HTM annual Exhibition Night in order to educate our community on this pertinent and contemporary topic.

### TASKS AND PRODUCTS:

- Students will research an urban ecology topic dealing with green building techniques, alternative transportation or alternative energy.
- Students will create magazine articles on their topic.
- Students will create and design artwork and magazine layouts.
- Students will build models to display their research topic.

### EXTENTIONS AND REAL WORLD CONNECTIONS:

- Students will design blueprints for their own green dream home or building.
- Students will research and help build our class human-powered bike generator.
- Students will get the chance to design our magazine cover, become student editors and write a magazine intro and letters from the editor.
- The class will visit local buildings that implement green building and/or LEED techniques.
- Guest LEED architects will speak to our class about the pertinence of urban ecology.

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**AREAS OF STUDY:**

Basic Principles of Green Building:

- Use of natural materials
- Efficiency
- On-site generation of renewable energy
- Reduction of environmental and human health impact
- Reduction of waste (during building and during inhabitation)

Green Building Techniques for research:

- Solar power (photovoltaic) and solar thermal
- Passive solar design
- Green roofing
- Permeable surface use (reduction of rainwater run off/ renewing groundwater sources)
- Grey water collection and recycling
- Compost toilets
- Straw bale
- Cob
- Cordwood
- Adobe
- Earthship
- Bamboo

Alternative Transportation Topics for research:

- Biodiesel as a fuel/ Converting cars to use it
- Hybrid cars
- Electric cars
- Ethanol as fuel
- Hydrogen Fuel Cells

**After reading this project description, one question I have about this project is...**

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**I have read and understand this project description:**

**Parent Signature:** \_\_\_\_\_

**Student Signature:** \_\_\_\_\_